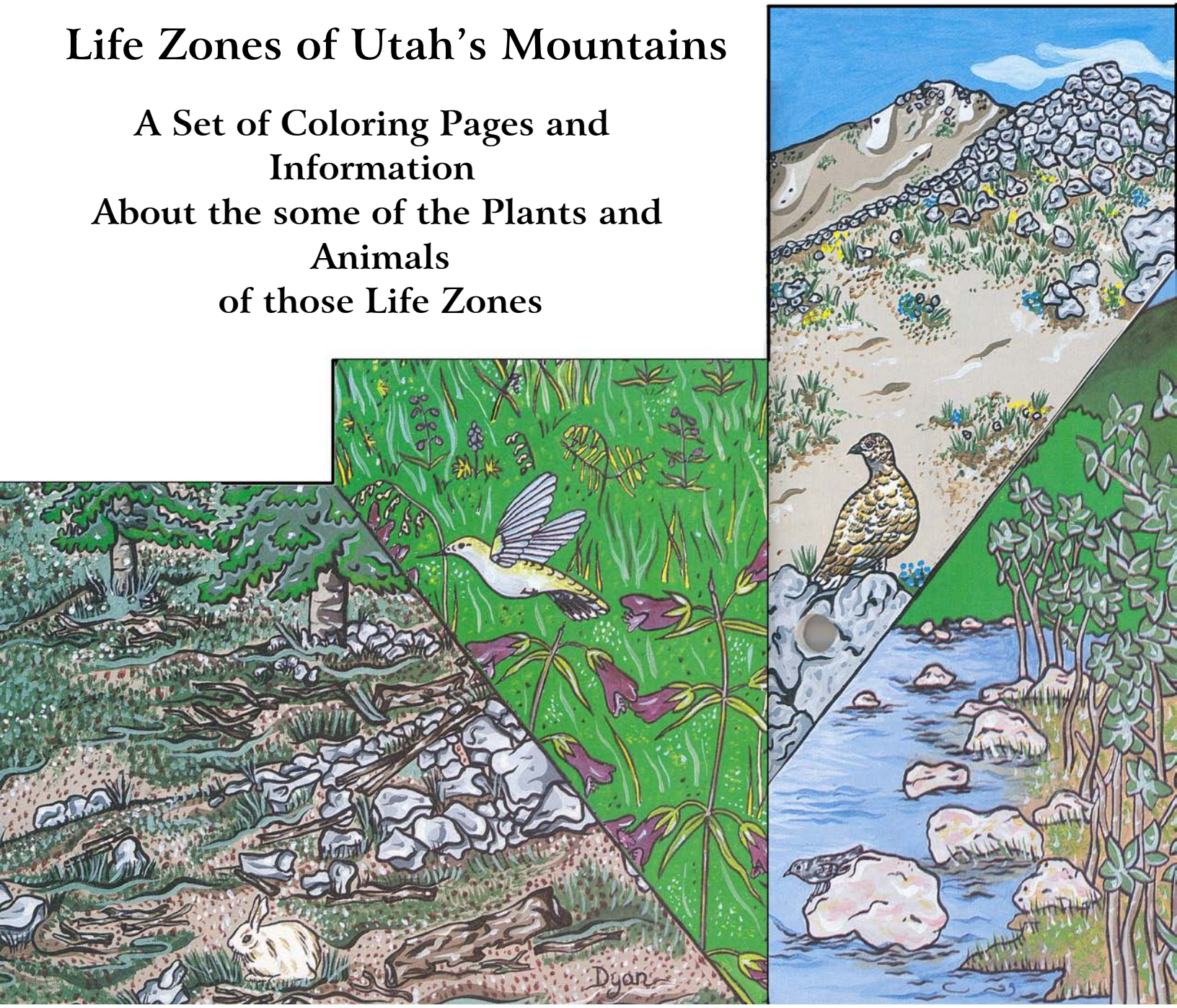
Life Zones of Utah's Mountains

A Set of Coloring Pages and Information About the some of the Plants and Animals of those Life Zones



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STATE OF UTAH
NATURAL RESOURCES
Division of Wildlife Resources

project WILD

Life Zones

In the late 1890s, a botanist named Clinton Hart Merriam thought of a way to help identify major plant and animal habitats. He divided the land into seven main groups he called Life Zones.

The Life Zone system is only used in the western part of the United States. Six of the seven zones are found in Utah; four—the Transition, Canadian, Hudsonian and Alpine Life Zones—occur as one travels upwards along the mountain ranges within the state. Elevation and temperature are two main factors that influence where plants and animals can live. As the elevation goes up, the temperature goes down. Thus, the plants and animals that live in higher, colder areas differ from those that live within lower, warmer areas.

Life Zones of Utah's Mountains

Alpine (above 11,200' - 12,000' depending on latitude) Wind and cold shape the alpine life zone to look like the arctic tundra. One hundred mile per hour winds, average annual temperatures below freezing, and limited effective precipitation create a treeless barren looking landscape. But if you look closely, you will discover an abundance of life. Moss pinks, a cushion-like plant, is similar to many of the plants found here. It is a slow growing perennial, short, with small parts except the flower, and leaves often covered by a protective cuticle or dense hairs to reduce water loss. You can find the alpine life zone in the Uinta Mountains.

Hudsonian or subalpine (9,500' - tree line) The tangled spruce-fir forest is the dominant plant community of this life zone. The climate is cold, windy and moist with most of the precipitation falling in the form of snow. Snow pack remains well into summer and the frost-free season lasts only two months. The dense stands of conifers modify the harsh climate by reducing wind speed and radiation intensity and by preventing moisture loss. Spruce-fir forest is the climax community because no other trees can grow in its shade at this elevation. The area around the town of Alta is a good example of the Hudsonian life zone.

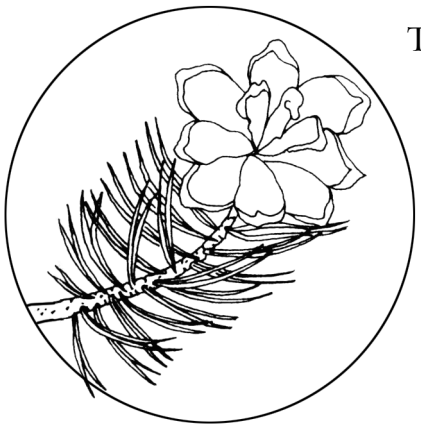
Canadian or montane (8,000' - 9,500') At this elevation in Utah you might find a forest dominated by lodgepole pine, ponderosa pine, aspen or Douglas fir. The dominant plant community is dictated by slope orientation, soil type, and soil moisture. All the forests at this elevation harbor critical habitats for many species of wildlife. Ponderosa pine forests can be found on Elk Ridge in the Abajo Mountains. Douglas fir forests are common in the Tushar Mountains. Lodgepole pine forests spread across the north slopes of the Uintas.

Transition or foothills (5,500' - 8,000') The most common plant communities at this elevation in Utah are pinyon-juniper woodlands and oak-maple shrublands. Pinyon-juniper woodlands cover 9 million acres in Utah. This "pygmy" forest occupies warm, dry sites with mean annual temperatures between 45° and 55°F. The frost-free season is usually over 80 days. Thick stands of oak-maple shrublands ring many of Utah's mountains. This plant community is often intermixed with mountain mahogany and provides important habitat to a diverse animal community.

Foothills (Transition) Life Zone

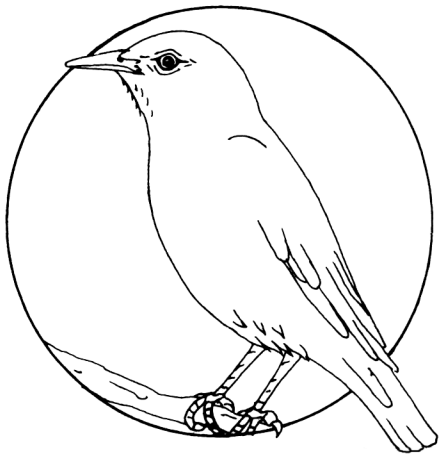
Pinyon-Juniper Woodland

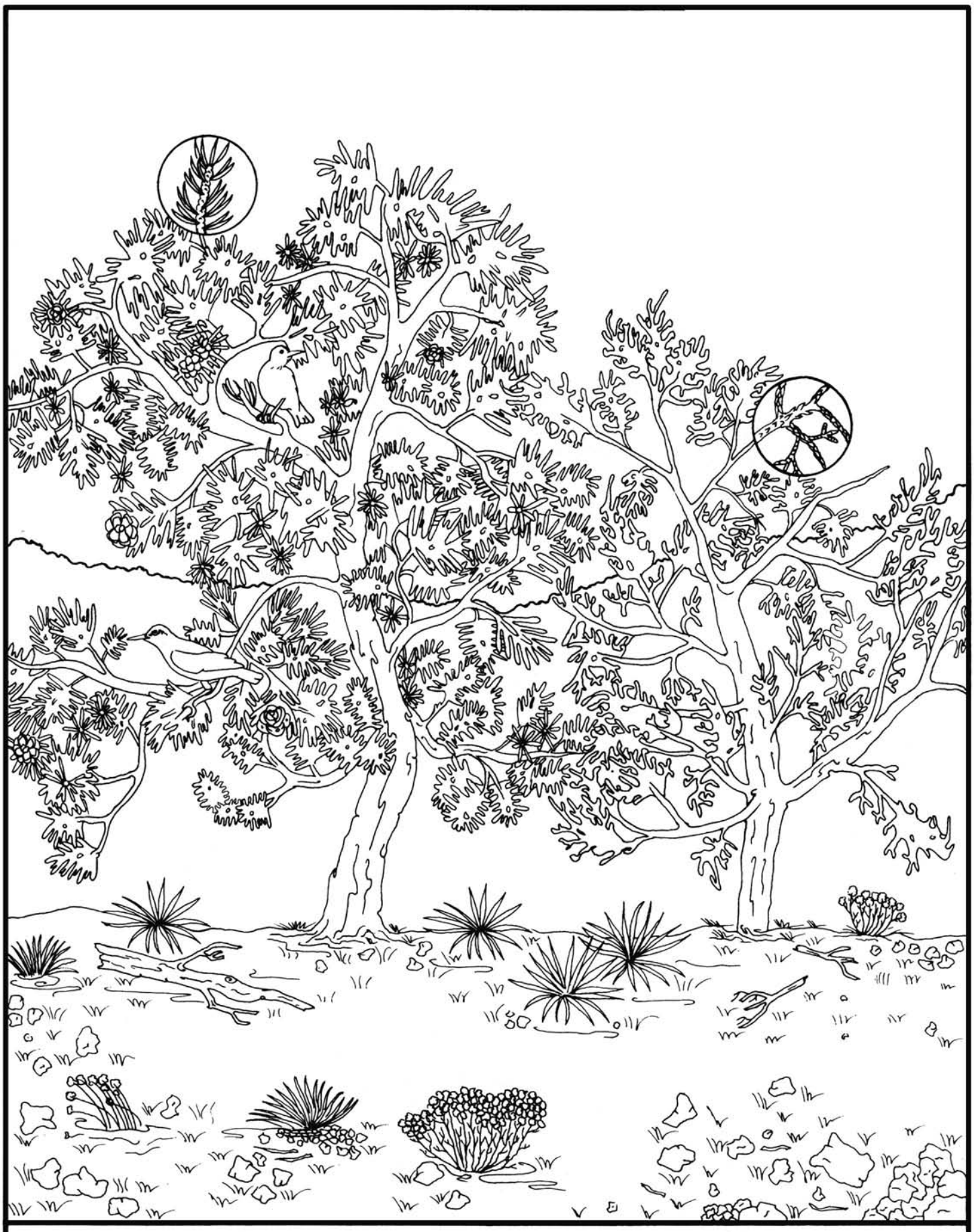
In the pinyon-juniper woodlands, pinyon and juniper trees grow close together in open, widely-spaced mixed clusters. There are usually more junipers at lower elevations and more pinyons at the higher limits. Both usually grow less than 30 feet tall. The *terrain* is dry and rocky. Most of the 10 to 20 inches of *precipitation* that falls each year is in the form of snow. Other plants growing in these woodlands include mountain mahogany, rabbitbrush, sagebrush, scrub live oak, big bluestem grass, and some prickly pear cactus. The mountain lion, bobcat, pronghorn, turkey vulture, pinyon mouse, pinyon jay, gray flycatcher, bushy-tailed woodrat, rock squirrel, black-tailed jackrabbit, gray fox, Western spotted skunk, Western meadowlark, mourning dove, barn swallow, black-billed magpie, golden eagle, plateau striped whiptail lizard, collared lizard, gopher snake, pallid bat, and Great Basin rattlesnake all make their home here. Wildlife from higher ranges, like elk and mule deer, often come down into this habitat during winter.



The **pinyon pine** is an evergreen tree that grows up to 30 feet tall. Its small cones produce pinyon nuts. Humans as well as animals eat these tasty seeds. Some Native Americans use pinyon nuts for various ceremonies, as well as for food. The pinyon tree's evergreen leaves are called needles because of their shape. The needles usually grow in bundles of two or three. Cones ripen every other year.

Pinyon jays live in large, noisy groups in the pinyon-juniper woodlands. Their favorite foods are pinyon nuts, juniper berries, and insects. They will pick all the seeds from a pinyon cone and stuff them down their throats. Then they choose a spot near the trunk of a tree and bury the seeds to use later as food in winter.



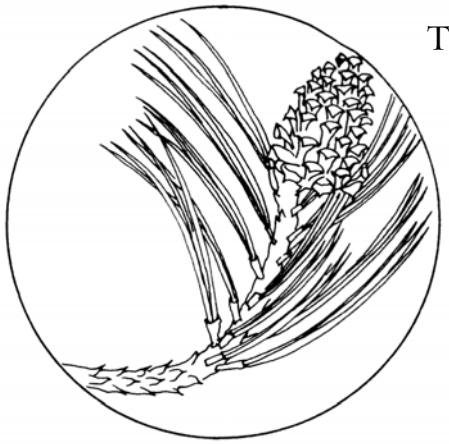


Pinyon-Juniper Woodland (Foothills Zone)

Montane (Canadian) Life Zone

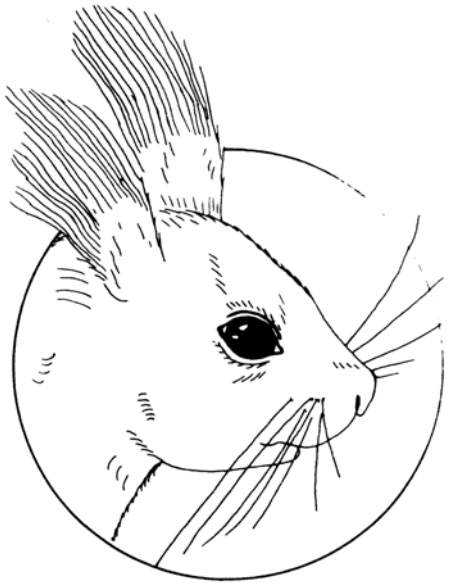
Ponderosa Pine Forest

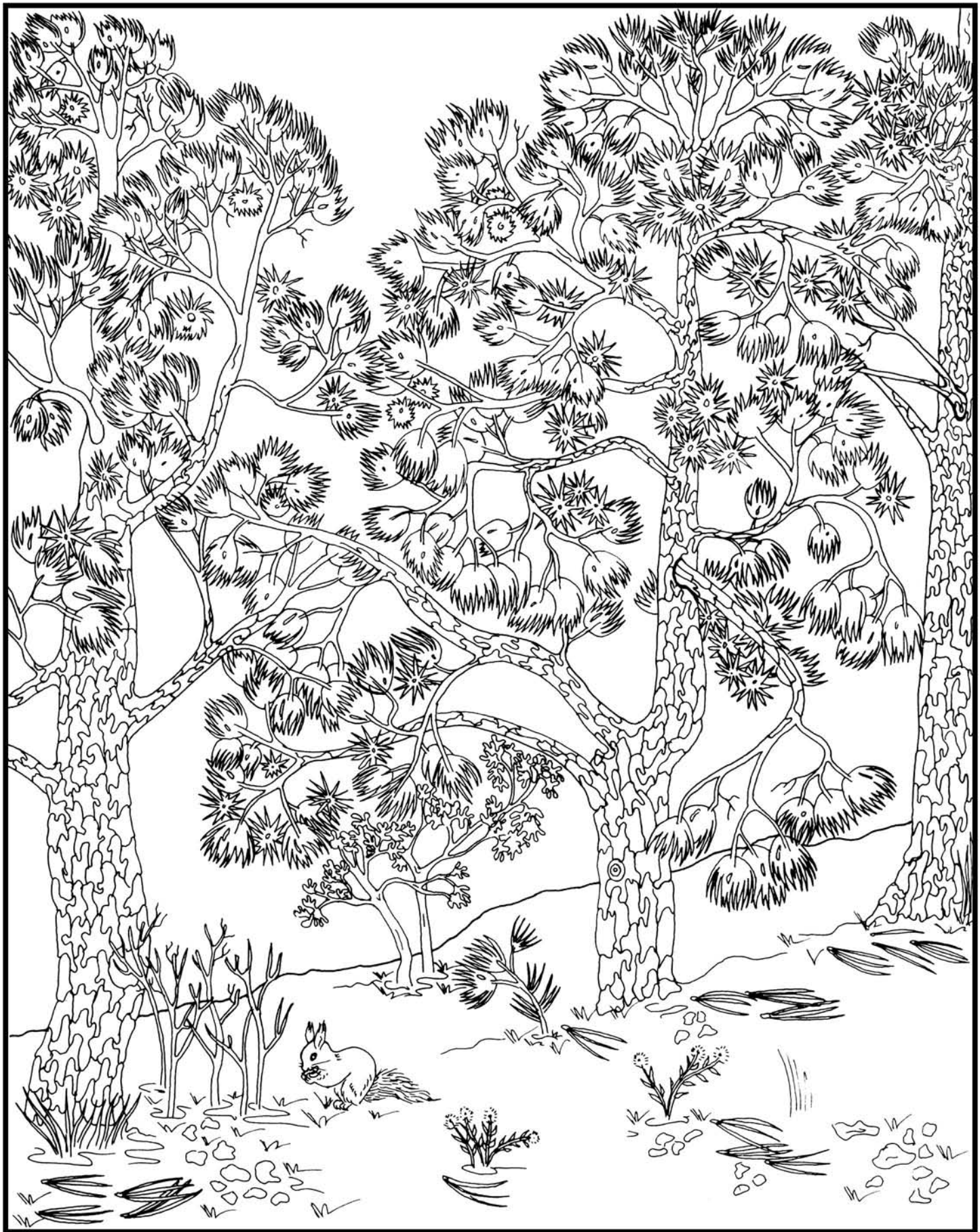
Ponderosa pines are the first tall forest trees you encounter as you climb beyond the foothills. It starts to get colder and wetter in this zone, a change from the warmer, drier climate below. About 20 to 25 inches of rain and snow fall each year. This helps many shrubs, vines, and berries to grow in the *understory* of taller trees. Ponderosa pine forests often look like parks, with younger trees mixed in with the older ones. Often the *understory* is very grassy with smaller trees, such as Gambel's oak, and shrubs growing in the open areas. Other plants include snowberry, skunkbush sumac, wild rose, and golden current. Wildlife that makes their homes here include silver-haired bats, mountain cottontails, porcupines, wild turkeys, Abert's squirrel, mule deer, Western bluebirds, Northern flickers, common ravens, Steller's jays, canyon wrens, great horned owls, flammulated owls, Sonoran mountain king snakes, and tiger salamanders.



The **ponderosa pine** is also called yellow pine because of the color of its bark. As the trees get older, the bark changes from brown to a reddish-yellow color. Needles usually grow three in a bundle and stay green all year round. This pine tree can grow up to 150 feet tall and live for 300 to 500 years.

The **Abert's squirrel** is a regular resident in ponderosa pine forests. You can recognize an Abert's squirrel by the blackish "tufts" of fur on its ears. It uses the ponderosa pine for food and shelter, building its nest in the Y-shaped branches. This tree squirrel eats the cone seeds, inner bark of small twigs, and the flowers of this pine.



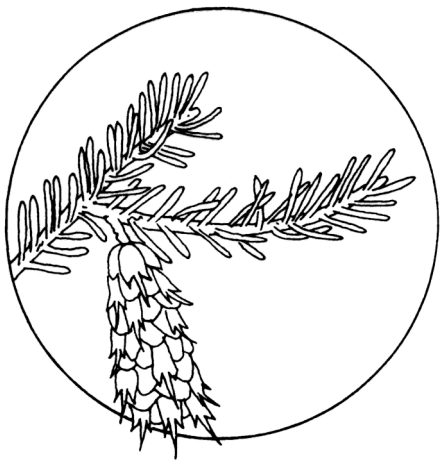


Ponderosa Pine Forest (Montane Zone)

Montane (Canadian) Life Zone

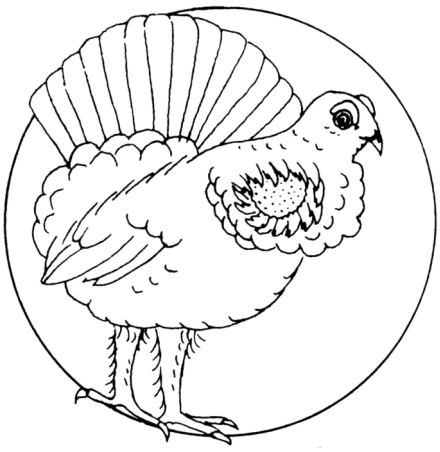
Douglas fir-white fir (mixed evergreen forest)

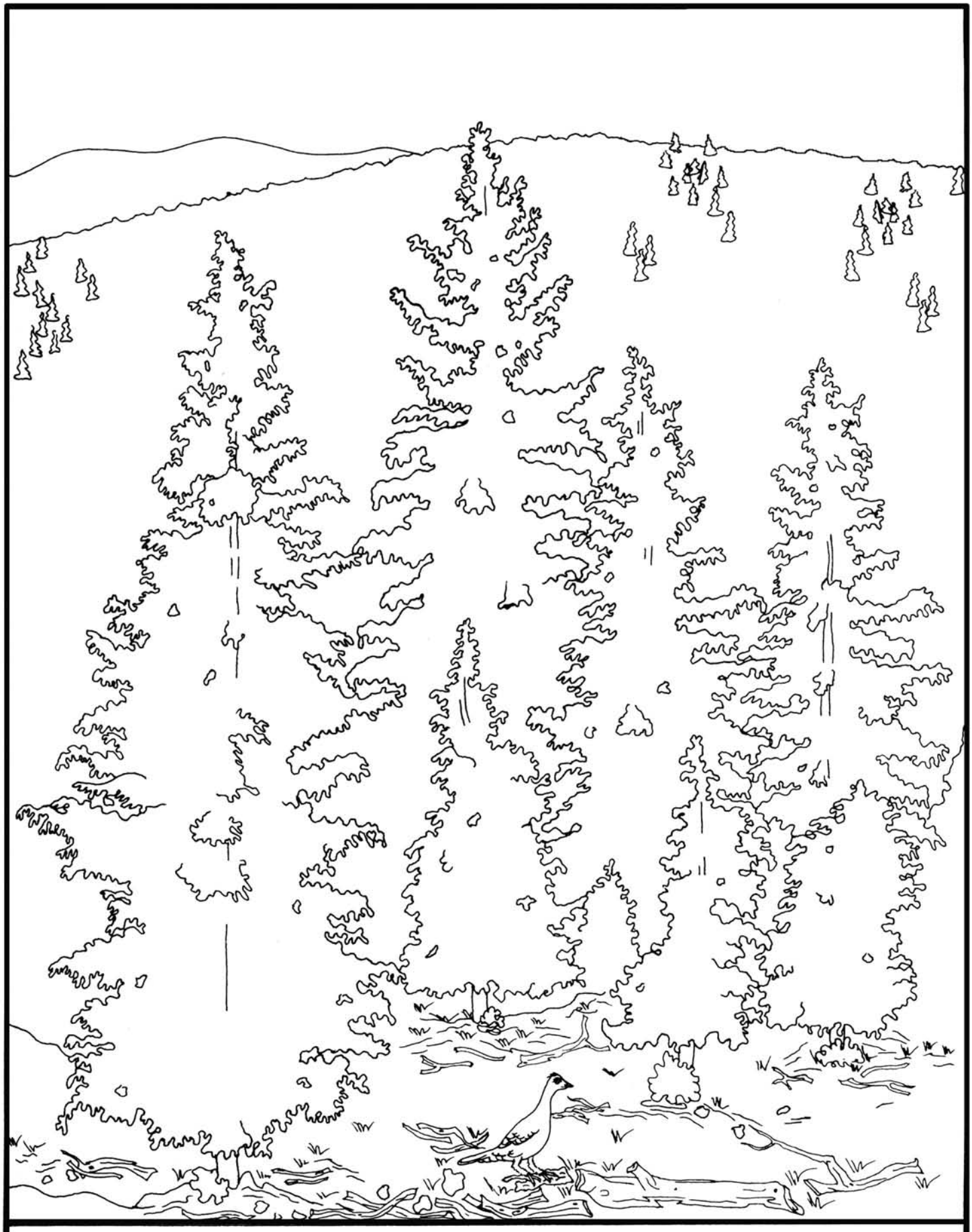
The *Coniferous* Forest Life Zone receives about 35 to 30 inches of rain arid snow each year. This *precipitation* feeds the streams that flow into the drier regions. The elevation of this zone is from about 8,500 to 9,500 feet. The Douglas fir/white fir habitat makes a thick *canopy* cover. These trees grow very tall. Lots of leaves, twigs and logs fall and cover the ground. This makes it hard for many plants to grow in the *understory.* Dead fallen trees provide a habitat for many small animals. As they rot, the logs also make a good place for seedlings to grow. Rocky Mountain maples, forest willows, limber pine, blue spruce, and aspens might also grow here. Other plants include huckleberry, strawberry, poison ivy, ferns, lichens, and mosses. Wildlife such as the great horned owl, Northern goshawk, Mexican spotted owl, white-breasted nuthatch, Steller's jay, blue grouse, mountain chickadee, deer mouse, long-tailed weasel, red fox, porcupine, black bear, tiger salamander, and the wandering garter snake also make their home here.



The **Douglas fir** is an evergreen tree. It is one of the tallest growing trees, reaching up to 130 feet tall. Needles are flat and bend easily. The pinecones hang down on the branches and have little "rat-tails" sticking out of the cones. The bark is reddish brown and very thick.

The **blue grouse** makes its home here. It has a short, strong bill and short, rounded wings that make it easier for the bird to fly through the dense forest. The males carry out a "hooting" behavior in the spring to attract females (hens). During courtship, males will engorge their yellowish orange combs above their eyes, and expose their bare, reddish neck skin, which is surrounded by a white rosette of feathers.



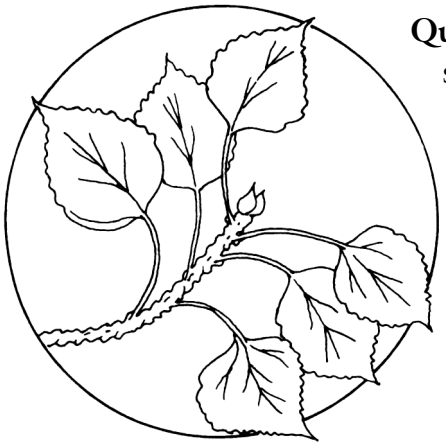


Mixed Evergreen Forest (Montane Zone)

Montane (Canadian) Life Zone

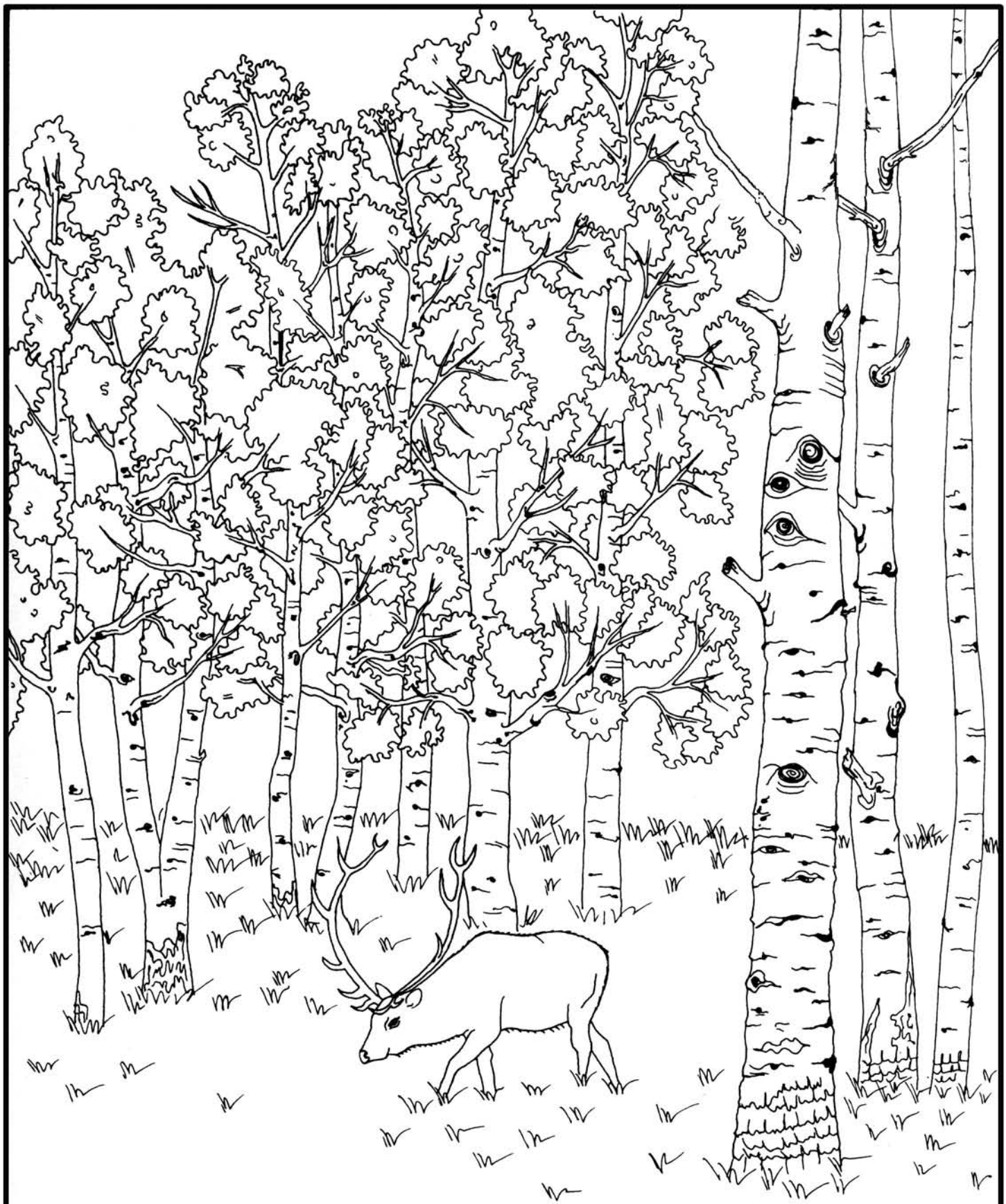
Aspen Woodland

Aspen trees grow in thick stands or groves in the *coniferous* zone, as well as in the life zones immediately above and below. Aspen trees sprout mostly from underground shoots from other aspen trees in areas where evergreen trees have blown down or have been removed because of fire or logging. Aspen tree canopies let in sunshine, which encourages a thick undergrowth of grasses and wildflowers. Aspen groves provide food and cover for many animals. Elk and deer like to browse aspen trees. Deep snow in winter keeps the soil from freezing, so animals like gophers can burrow all winter. In old aspen stands, many of the older trees are dead. These trees make great homes for woodpeckers, and the insects that eat the dead wood become food for many birds. Other wildlife that lives here are big brown bats, shrews, mountain cottontails, elk, black bears, golden-mantled ground squirrels, wild turkeys, mountain bluebirds, American kestrels, Northern flickers, Northern saw-whet owls, and wandering gartersnakes. *Understory* plants that grow here include gooseberries, currants, wheatgrass, bracken fern, and lupines.



Quaking aspens have a greenish-white bark with dark eye-shaped marks. They get their name because their leaves are always fluttering or "quaking" in the wind. Leaves are shiny green until fall when they turn a beautiful gold. Aspens will invade a mixed-evergreen area soon after a burn. There, they will become shade trees to *conifer* seedlings that eventually will replace them.

The **elk** is a large member of the deer family. Males (bulls) have large antlers. They shed these antlers each winter and grow a new set by the following fall. Females (cows) are smaller than the males. They are most active at dusk and dawn. Food includes grasses, *forbs,* and the leaves and hark of aspen trees. During the rut (mating) season, a bull elk can acquire 10 to 40 females in his harem. Calves are born in May and June.

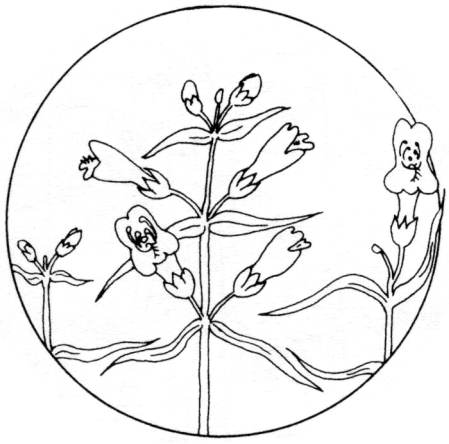


Aspen Woodland (Montane Zone)

Montane (Canadian) Life Zone

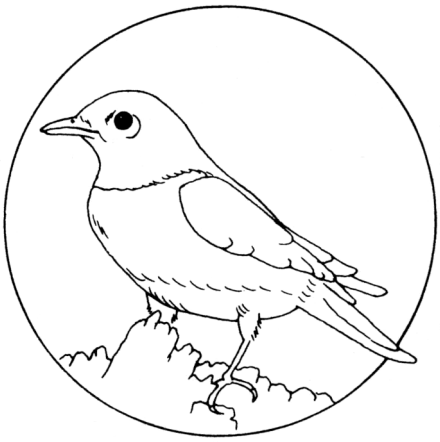
Mountain Meadow

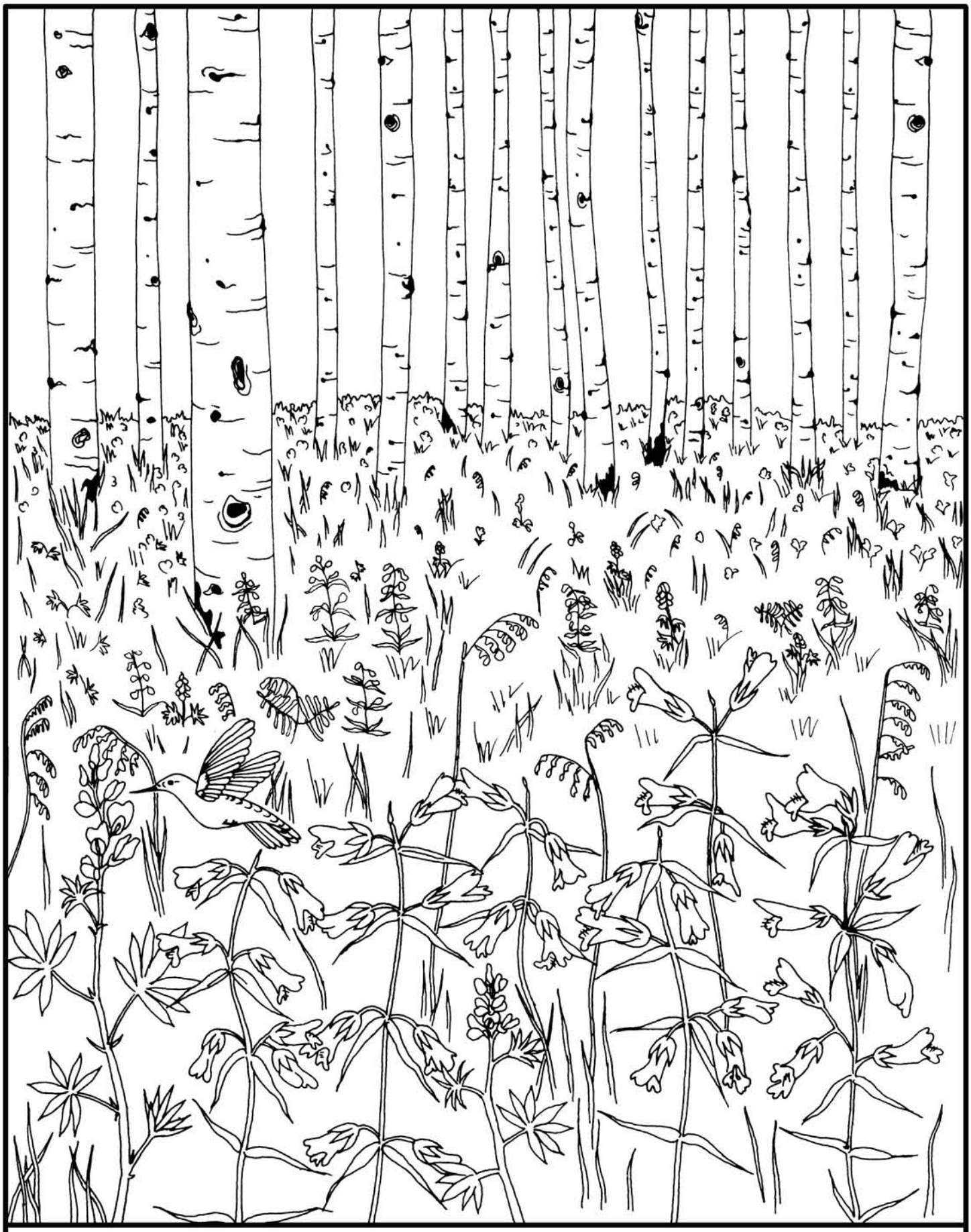
Meadows can occur in many life zones. They are big open spaces, usually without trees. Roots of the many grasses that grow here prevent little tree seedlings from taking root. In the forest life zone, snow that melts in the spring helps get things growing. Burrowing animals help to loosen the soil, which helps hold water in the soil. Many birds and animals use meadows for food. Nearby forests are used for shelter and nesting. Wildlife that can be seen in this habitat include black bear, elk, mule deer, sharp-shinned and red-tailed hawks, Western bluebirds, hummingbirds, silver-haired bats, striped skunks, red foxes, montane voles, Northern pocket gophers, dwarf shrews, boreal toads, Western chorus frogs, meadow jumping mice, and tiger salamanders. Wildflowers that grow among the grasses and sedges include penstemon, Rocky Mountain iris, yarrow, Indian paintbrush, fleabane daisy, and lupines.



Whipple penstemons like to grow in open meadows in the montane forest life zone. The whipple penstemon flowers grow mixed in with grasses arid other wildflowers. Flowers are a dark purple color. This penstemon can grow up to two feet tall. Penstemons are also called "beardtongues" because of the fuzzy *stamen* that rests on the lower petals.

The favorite habitat of the **Western bluebird** is in open woodlands arid meadows. The male is a deep blue with a rust-colored breast. Females are gray with dark blue wings and tail. They make their nests in holes in trees. Favorite foods are insects and fruit.



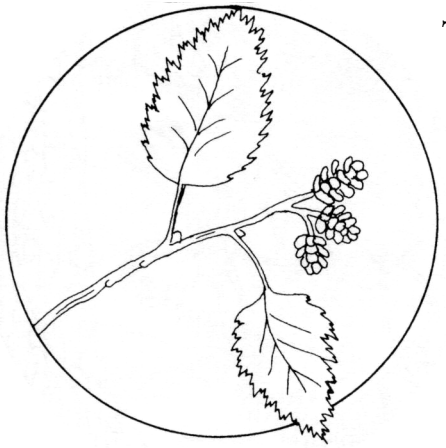


Mountain Meadow (Montane Zone)

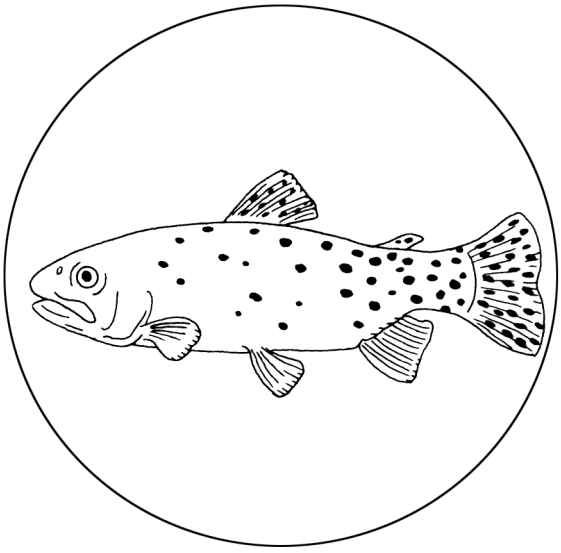
Montane (Canadian) Life Zone

Mountain Riparian

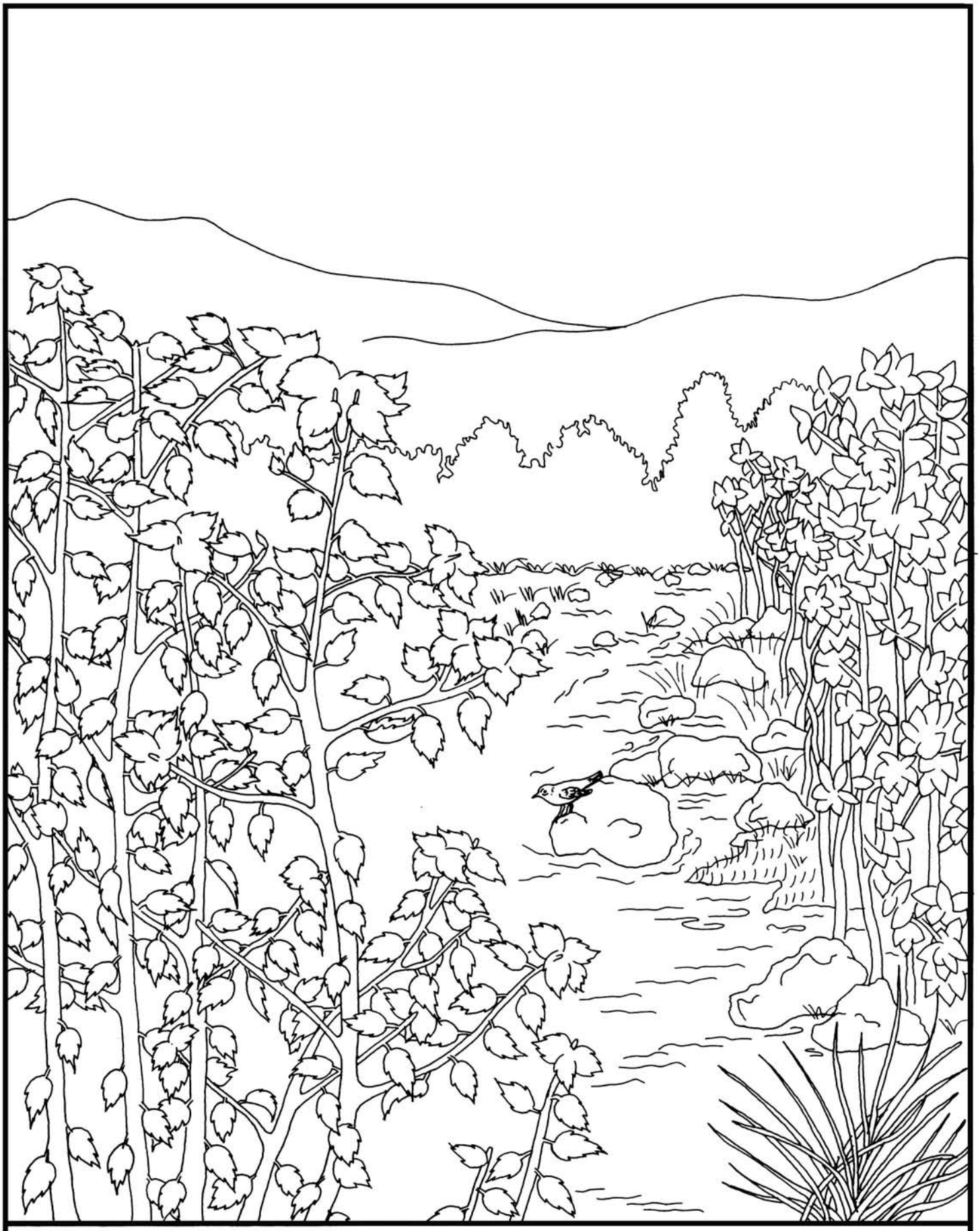
River habitats *(riparian* zones) provide fresh water, food, and shelter for many animals. There are usually twice as many animals here as in surrounding habitats. Tall, wide-leafed trees make up the *canopy.* Lots of plants grow close together in the *understory.* Many streams flow year-round in this life zone. As the water flows downstream, swirling *rapids* are followed by calmer water. Twigs, leaves, and insects float along with the current, becoming food for many animals. Stream *algae* grows on top of rocks. *Larvae* and small insects can live on the undersides of the rocks. Temperatures tend to be warmer in winter and cooler in summer in stream habitats. Common plants are alders, water birch, willows, box elders, mulberry, blue spruce, chokecherry, Gambel's oak, Virginia creeper, sedge-grass, and water-loving wildflowers. Wildlife includes beaver, raccoon, wild turkey, broad-tailed hummingbirds, Western tanagers, ruby-crowned kinglets, violet-green swallows, American dippers, belted kingfishers, wandering garter snakes, brown trout, and cutthroat trout.



Thin-leaf alder trees form thickets along many stream banks. They grow in thick stands, often with river birch trees. Several stems grow from one big base. These alders can grow up to 30 feet tall. The bark is a grayish color. The leaves grow two to four inches long and have toothed edges. The female flowers turn into little cones. American beaver, mule deer, and cottontails like the alder's bark. Birds like to eat the seeds.



The **Bonneville cutthroat trout** is native to Utah, and is Utah's state fish. Like all cutthroat trout, it has an orange sash mark on the throat. Its back and sides are silver- gray to charcoal in color with large round dark spots. It likes cold, clear water. The female lays her eggs between March and July, making a gravel nest in flowing water. Bonneville cutthroat trout like to eat insects in summer, as well as tiny plants and animals that live in the stream.

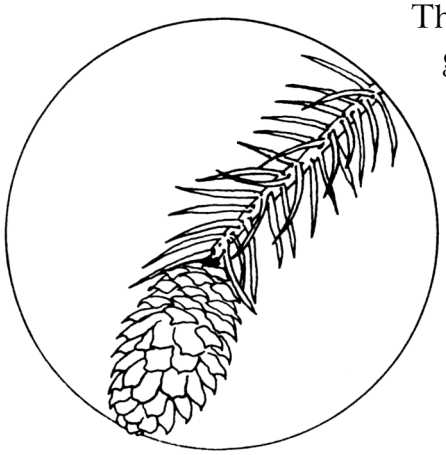


Mountain Riparian (Montane Zone)

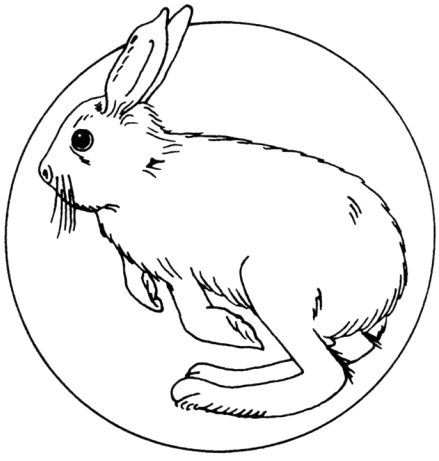
Subalpine (Hudsonian) Life Zone

Englemann Spruce-Subalpine Fir (spruce-fir forest)

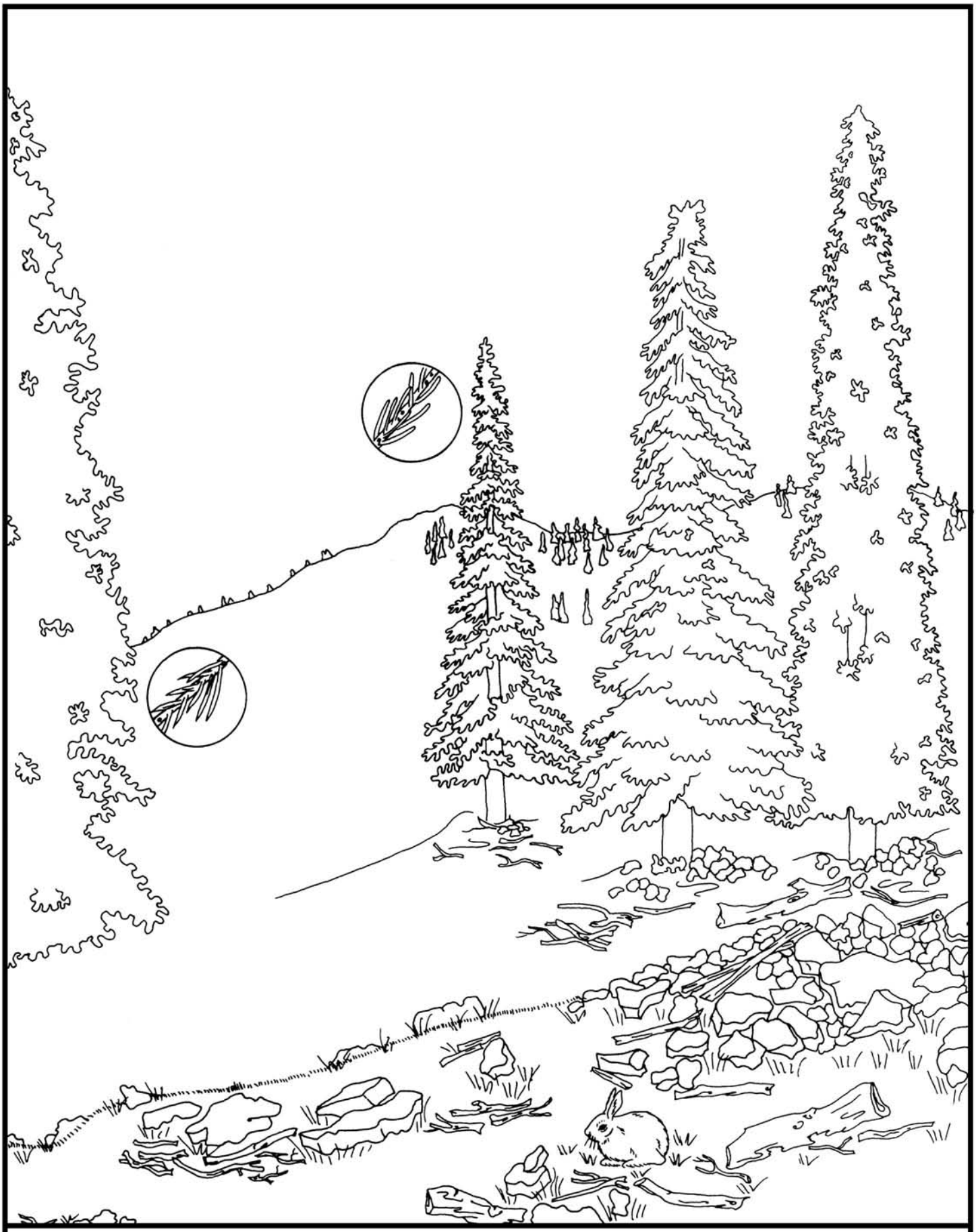
Between 9,500 and 11,500 feet above sea level lies the Subalpine Life Zone. This is the most *humid* life zone, since it is covered with snow six to nine months each year. Rain and snowfall can be 30 to 60 inches a year. That leaves only about two months for tree seedlings to sprout and flowering plants to produce flowers and seeds. The major plant community in this zone is the Englemann spruce and subalpine fir forest. Shade from the forest and cool temperatures help keep snow on the ground until late spring. Trees, and other plants growing here, tend to be smaller than those growing in the zones below. Growing closer to the ground helps protect them from the harsh winds. Other plants that grow here are bristlecone pine, dwarf junipers, currants, honeysuckle, huckleberry, alpine clover, and bluegrass. Wildlife making homes here include elk, mule deer, Rocky Mountain bighorn sheep, snowshoe hare, least chipmunk, pine marten, red squirrel, vagrant shrew, blue grouse, red crossbill, pine grosbeak, yellow-bellied sapsucker, Clark's nutcracker, gray jay, boreal owl, and Northern flicker.



The **Englemann spruce** is an evergreen tree that can grow up to 100 feet tall. This spruce has a real "cone" shape. It is pointed at the top, and little by little, fans out into a wide bottom. Cones hang down from the branches. Their scales are very papery and bend easily. Needles are a bluish-green. When they fall off the branches, a rough scar remains on the twigs. Englemann spruce can live up to 500 or 600 years.



Snowshoe hares live in forests with a bushy *understory*. They rest in depressions in the thick cover. In winter, their coats turn white. This protects them by helping them blend in with the snow. Their coats turn brown again for summer. Their hind feet are especially large and have extra hairs that help them walk on top of the snow.



Spruce-Fir Forest (Subapline Zone)

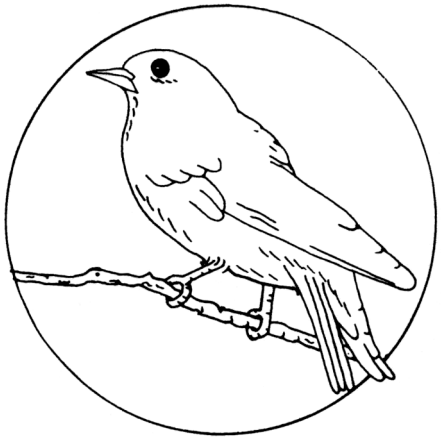
Sub-Alpine (Hudsonian) Life Zone

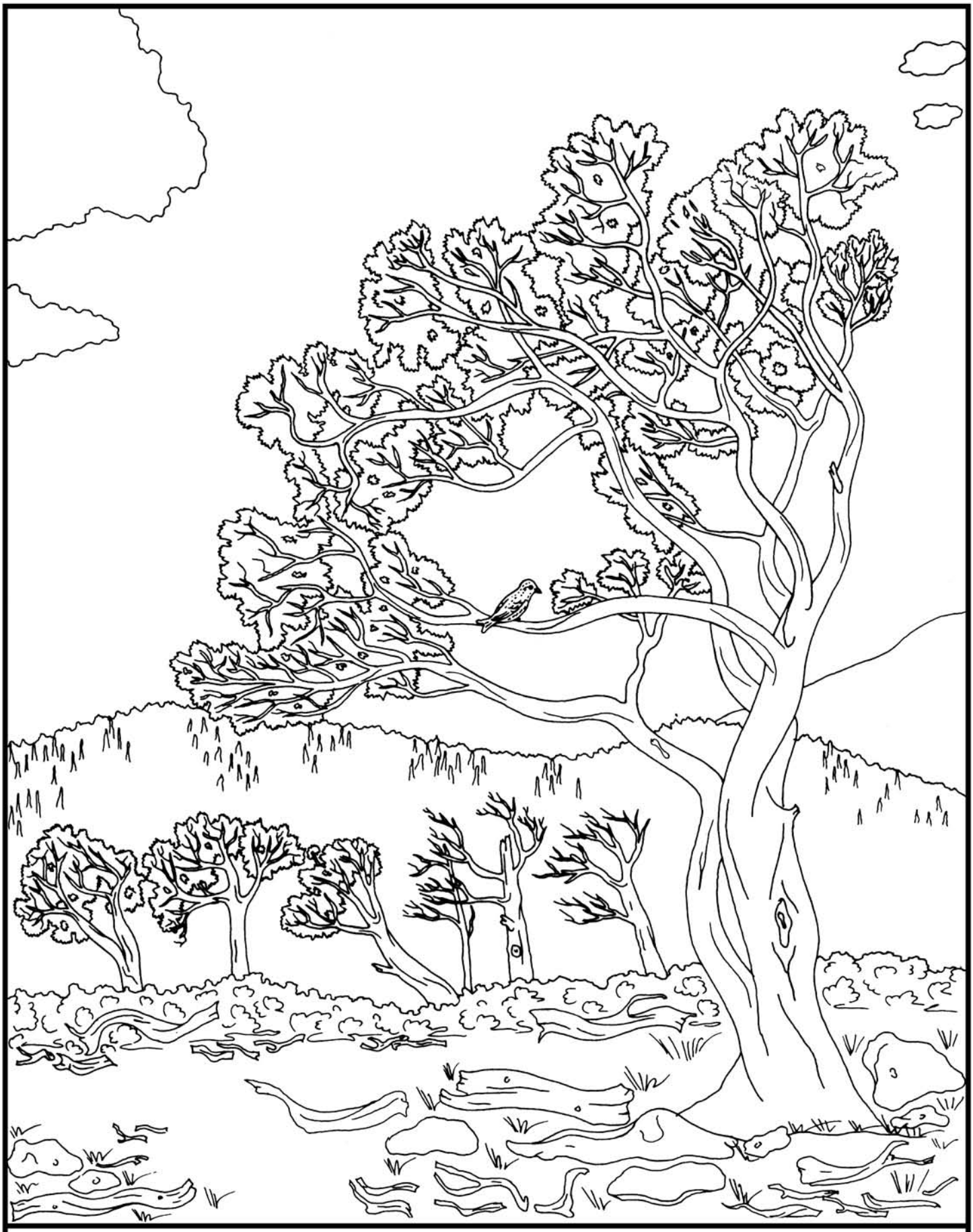
Bristlecone Pine

Bristlecone pines ring the edges of the alpine zone atop Utah's highest peaks. These Trees tend to grow in clumps on gravely or rocky *outcrops.* This helps protect small seedlings from the strong winds, especially near *timberline.* Old dead trees that have fallen down also play a part in nature's cycle. Wind can knock down branches, and ice can wear down the bark. That is why many of these trees have a twisted look. The side facing the wind usually has fewer branches than the other side. As you get closer to *timberline,* trees tend to become smaller and even more twisted. Summer visitors in this zone include elk, mule deer, coyotes, Rocky Mountain bighorn sheep, yellow-bellied marmots, American pikas, Clark's nutcrackers, and rosy finches. The same plants and wildlife from the Englemann spruce and subalpine fir forest can also be found growing among the bristlecone pines.

Bristlecone pines like to grow in wind-swept places. This often makes them grow very twisted in shape. The tips of their cone scales have sharp "bristles" on them. These dark green pines are some of the oldest living trees on earth. Tree age can be figured out by counting the *annual rings* of the trunk. Some bristlecone pines are known to be over 1,000 years old, and the oldest bristlecone pine ever recorded (lives in California) is 4,600 years old!

The **pine siskin** is a little finch. These birds have yellow streaks at the base of their tails and also on their wing feathers. Their bills are sharp and thin, making it easy to pick out seeds from cones and other seedpods. They can often be seen hanging upside-down while they eat these seeds!





Bristlecone Pine (Subalpine Zone)

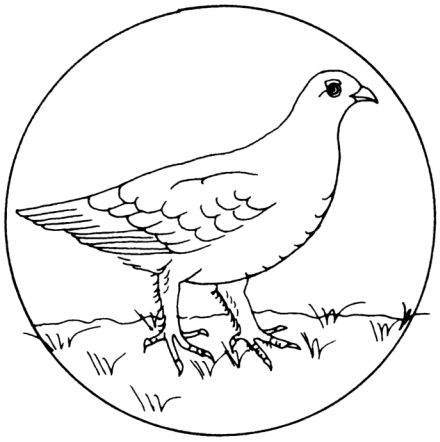
Alpine Life Zone

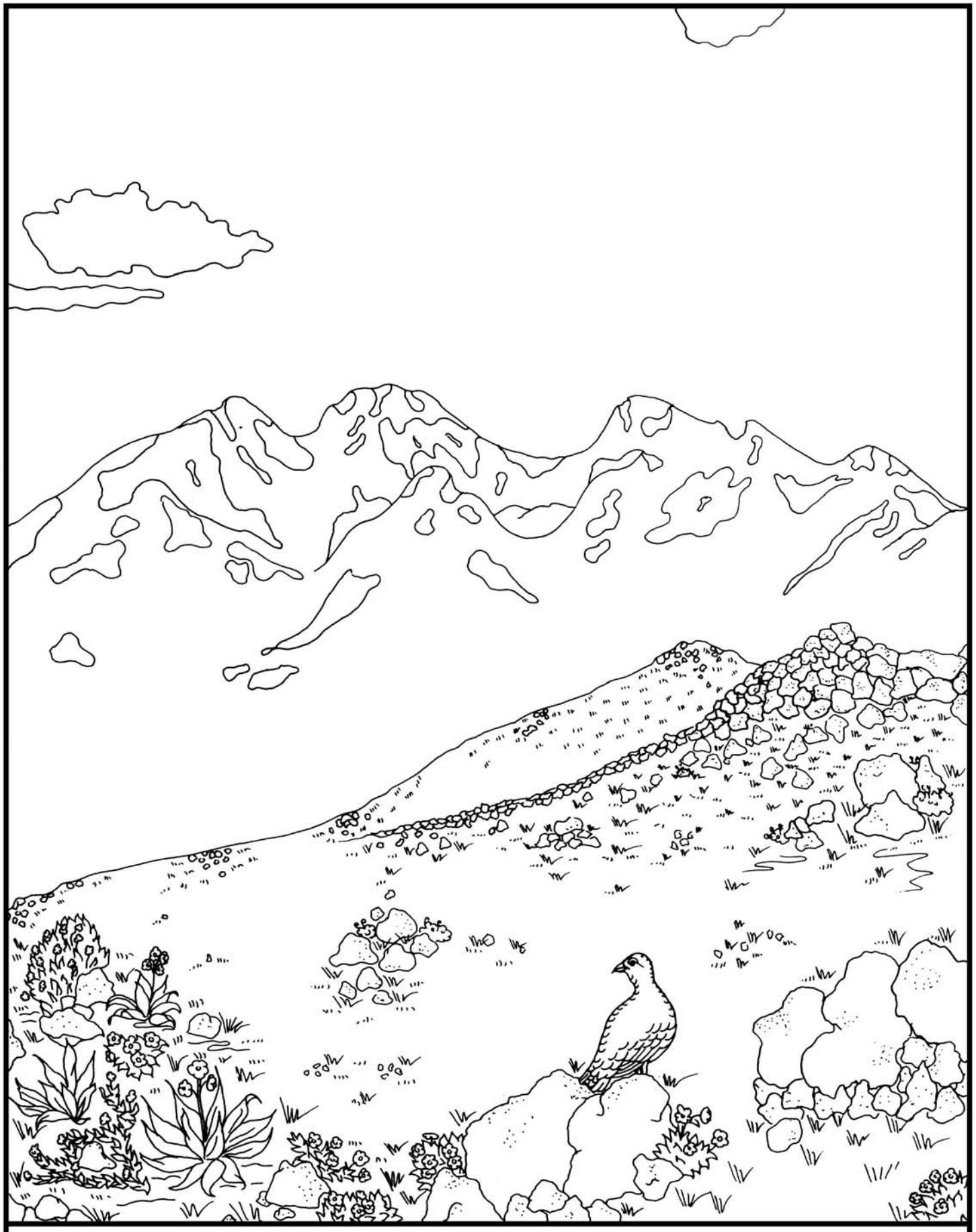
Tundra

The highest life zone in Utah is the arctic-alpine *tundra.* Above *timberline,* this life zone ranges from 11,500 feet to more than 12,000 feet in elevation. This is the wettest and windiest life zone. Here the air is thinner, and temperatures are cooler. There are no trees in this zone. The Alpine Zone in Utah can be found in the Uinta Mountains. Small, low-growing plants, similar to those that grow in the arctic, are found here. Annual rain and snowfall can accumulate to a depth of more than 40 inches. Snow that melts in summer feeds streams below, helping to water the land. Common plants include tufted hairgrass, alpine fescue, golden avens, alpine forget-me-not, sedges, spike woodrush, and lichens. Wildlife adapted to this cold environment include the pika, white-tailed ptarmigan, Rocky Mountain bighorn sheep, deer mouse, masked shrew, Northern pocket gopher, yellow-bellied marmot, horned lark, white-crowned sparrow, rosy finch, golden eagle, and the boreal toad.

Plants in the Alpine Zone often grow in thick little clusters. Among these "cushion-type" plants is the **alpine forget-me-not,** which grows close to the ground. This plant grows best in open, rocky places in the high mountains. Its flowers are a deep blue, and its hair-covered leaves appear as if they were made of wool.

The **white-tailed ptarmigan** is a bird that is common on rocky alpine slopes and high meadows. It has red "combs" over its eyes. In the winter, this ptarmigan turns white to match the snow. Its upper feathers gradually turn brown, mixed with white in springtime. Its tail and undersides stay white all year long. Feathers cover its legs and feet.





Tundra (Alpine Zone)

GLOSSARY

ALGAE - Simple one-celled or many-celled plants; usually aquatic.

ANNUAL RING - A layer of wood produced by one year's growth.

CANOPY - Layer formed by the leaves and branches of the forest's tallest trees.

CONIFER - A plant that bears its seeds in cones.

CONIFEROUS - Refers to cone-bearing. Coniferous forests include pines, firs, and spruce trees.

FORBS - Low-growing green (herbaceous) plants, not including grasses.

HUMID - Containing a lot of moisture.

LARVAE - The immature form of many insects.

OUTCROP - The part of a rock formation that can be seen above the ground.

PRECIPITATION - Water reaching the ground in the form of hail, mist, rain, sleet, or snow.

RAPIDS - The part of a river where the current is fast.

RIPARIAN - Located or living along or near a stream, river, or body of water.

STAMEN - The male part of a plant.

TERRAIN - The physical features of a landscape.

TIMBERLINE - The upper limit of tree growth on mountains.

TUNDRA - Treeless vegetation in regions with long winters and low annual temperatures.

UNDERSTORY - The layer of plants growing under a higher canopy layer of forest trees.